Don't Call That Ball 'Out' Yet

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Weekend Edition Saturday

According to a new study, the inability to judge a ball "out" is actually embedded in the mechanisms of the human brain. Guest host Alison Stewart speaks with David Whitney from the University of California Davis about challenging the referee.

ALISON STEWART, host:

How is it in the split second it takes a tennis ball to strike the court, a referee can tell whether a ball is in or out? The answer if that referee calls the ball out is that they can't really determine it. And according to a new study, the inability to judge a ball out is actually imbedded in the mechanisms of the human brain. David Whitney is the lead author of the study. He joins us from the University of California, Davis, where he's an associate professor of psychology. Professor Whitney, thanks for speaking with us.

Dr. DAVID WHITNEY (Associate Professor of Psychology, University of California, Davis): Thank you very much.

STEWART: First of all, how did you come up with the idea to study tennis calls?

Dr. WHITNEY: Well, my lab has actually been studying the visual system's ability to localize objects for many years now. And what we usually do is study how the brain perceives object position in rarified situations where we just look at computer monitors and videos. But when I watched the 2007 Wimbledon Championship, I came across a challenged call. And after the challenge, there was an instant replay, and it showed where the ball had actually landed. And the call was incorrect. The ball had landed on the line, but the ref had called it out. And at that

moment it occurred to me that, wow, I could take all of the stuff that we've been doing and apply it to the real world.

STEWART: What is it that causes the perception that this ball might be out when it's actually in?

Dr. WHITNEY: The brain faces some serious challenges when trying to code information. If we're trying to drive down the road and avoid a cyclist, or see a stop sign, avoid a pedestrian; every time we're walking around; or we're trying to pick up a coffee cup, there is so much information there, the brain has to use shortcuts. It has to use heuristics or tricks to avoid getting overwhelmed with information. And one of the tricks that it uses is predicting object trajectories. With a tennis ball, it's hard though. The tennis ball makes an unpredictable change. It bounces. And the visual system can't predict this very well. And when that happens, the visual system has this slight error, and the error is that the position at which the tennis ball bounces appears shifted in the direction of motion.

STEWART: This is a little bit of an obnoxious question. So if you're a tennis player and your ball has been called out, you should challenge it.

Dr. WHITNEY: Well, it depends on if it's clearly out, then it's clearly out. If it's a very close call, it would benefit the players most first to maximize their challenges, use up all of your challenges, and second it would benefit them most to predominantly challenge those calls that are out. Challenge the out calls more than challenging the in calls.

STEWART: Do you play tennis?

Dr. WHITNEY: I used to, and I was terrible at it. And so I became a scientist.

STEWART: Professor Whitney, thank you so much for sharing your study with us. We really appreciate it.

Dr. WHITNEY: Oh, it was my pleasure. Thank you very much.

STEWART: David Whitney is an associate professor at the Center for Mind and Brain at UC Davis. His study, perceptual mislocalization of bouncing balls by professional tennis referees, appears in this week's issue of the journal Current Biology. This is NPR News.